

# Systematic studies in *Dracophyllum* (Epacridaceae) 2. New species of *Dracophyllum* in New South Wales

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## Abstract

Brown, E.A.<sup>1</sup> and Streiber, N.<sup>2</sup> (<sup>1</sup>Royal Botanic Gardens, Mrs Macquaries Road, Sydney, NSW 2000, Australia; <sup>2</sup>School of Biological Science, University of New South Wales, Sydney, NSW 2052, Australia) 1999. Systematic studies in *Dracophyllum* (Epacridaceae) 2. New species of *Dracophyllum* in New South Wales. *Telopea* 8(3): 393–401. A morphological review of *Dracophyllum secundum* R.Br. has resulted in the recognition of two new species. *D. macranthum* E.A.Br. & N.Streiber, from the Lansdowne area of the North Coast of New South Wales, has leaf morphology similar to that of *D. secundum*, but also has a distinctive basipetal maturing inflorescence and long corolla tubes. *D. oceanicum* E.A.Br. & N.Streiber, from the Jervis Bay area, South Coast (New South Wales), grows on seaside cliffs and has numerous flowers per node like *D. fitzgeraldii* and *D. sayeri* but differs in having less development of the secondary axes in the inflorescence, staminal filaments inserted on the receptacle and only slightly adhering to the corolla tube and stamens included in the corolla tube. An amended description of *D. secundum* R.Br. and a new key to *Dracophyllum* species in New South Wales are provided.

## Introduction

A morphometric study of the genus *Dracophyllum* in New South Wales has shown that two taxa, previously included in *D. secundum* R.Br. are sufficiently distinct to justify their recognition as separate species (Streiber et al. 1999). The genus has been adequately described in several publications (e.g. Powell 1992, Virost 1975). This paper presents descriptions of the two new species *D. macranthum* and *D. oceanicum*, an amended description of *D. secundum*, and a key to the genus in New South Wales.

## Taxonomy

### 1. *Dracophyllum macranthum* E.A.Br. & N.Streiber, sp. nov.

Frutex glaber, usque ad 3 m altus. Folia (85–)140–200 mm longa, 6–9 mm lata; margo serrulata. Inflorescentia ab apice usque ad imum maturescens; flores 2 vel 3 per nodum basalem. Tuba corollae rosea vel rubiginosa, (16–)18–22(–25) mm longa, calyce saltem duplo longior; lobi corollae albi, 2.5–4 mm longi, 1.5–3 mm lati; stamina in fauce corollae inclusa, filamentis fundo tubae insertis, 18–20 mm longis. Stylus filiformis, (14–)17–19 mm longus, apice parum exserto.

Holotype: New South Wales: North Coast: Track to Newbeys Cave (an overhang), c. 100 m from Newbeys Creek Road, on Newbeys Creek, 31°44'19"S, 152°31'44"E, 270 m alt., E.A. Brown 97/51, N. Streiber & D.M. Crayn, 12 Aug 1997 (NSW 411514). Isotypes: CHR, MEL, NY.

[*Dracophyllum* sp. 'Lansdowne' (Brown 97/51) in Streiber et al. (1999)]

Shrub 0.6–2(–3) m tall, glabrous, initially erect to spreading but longer branches frequently pendent, open and often sparsely branching from c. 10 cm above base; bark somewhat fibrous, deeply and regularly fissured, grey with reddish tinge towards base of fissures, frequently with dark blotches and lichens; branches distally reddish brown, smooth between leaf scars. *Leaves* usually not persisting more than 20 cm below apex, erect to spreading, sheathing at base; sheath pale brown, c. 8 mm long and 12 mm wide, gradually narrowed into lamina, margin somewhat membranous; lamina coriaceous, dark to mid green, abaxially slightly paler, linear-triangular, (85–)140–200 mm long, 6–9 mm wide, flat to slightly concave (becoming more so when dried); margin serrulate, up to 8 teeth/cm basally (usually 2 or 3), teeth more numerous distally, antrorse; tip acute and often brownish. *Inflorescence* (a variously modified superconflorescence, Streiber et al. 1999) terminal, flowers maturing basipetally; primary axis reddish brown; each node with a caducous leaf-like bract, usually with 2 or 3 flowers per node basally and 1, or occasionally 2, flowers per node distally; flowers large for genus, deflexed to spreading, becoming erect after corolla has dropped (probably  $\pm$  erect in bud), sometimes secund. *Bracts* brown, triangular, c. 50 mm long, 11 mm wide, with sheath, margin and apex as for leaves (only basal bracts observed). *Bracteoles* similar to bracts but smaller, c. 8 mm long, 0.5 mm wide. *Pedicel* reddish brown, 1.5–3 mm long. *Calyx* rose-coloured (becoming scarious and reddish brown with margin paler in fruit), lobes triangular, (8–)9–10(–11) mm long, 2–2.5 mm wide, c.  $\frac{1}{2}$  corolla length; margin membranous, ciliate especially in distal half; apex acute. *Corolla* dark pink becoming red with age, lobes white; tube cylindrical, (16–)18–22(–25) mm long, 3–3.5(–4) mm diam.; lobes spreading, ovate, 2.5–4 mm long, 1.5–3 mm wide, base obtuse to subcordate, apex obtuse, surface rugose-verrucate. *Stamens* with filaments inserted at base of corolla tube, 18–20 mm long; anthers attached above midpoint, 2–3 mm long, barely included in corolla throat. *Pistil* slightly longer than corolla tube; nectary scales separate,  $\pm$  half height of ovary, upper margin  $\pm$  irregularly toothed and truncate; ovary  $\pm$  cylindrical, 2–3 mm long, 1–2 mm diam., smooth, locule septum showing as paler vertical line; style filiform, (14–)17–19 mm long, minutely papillose distally; stigma indistinctly 5-lobed. *Fruit* brown, shorter than calyx, style often persisting, seeds not observed. (Fig. 1).

**Flowering:** August–October (rarely to December). **Fruiting:** ?January–February

**Other specimens examined:** New South Wales: North Coast: Kendall District, *Bailey 80*, Sep 1929 (NSW 411235); Newbeys Creek area, *Brown 97/50*, *Streiber & Crayn*, 12 Aug 1997 (NSW 417521), *97/50b* (NSW 412086, BRI), *97/50c* (NSW 411513), *97/55* (NSW 411547), *Crayn 251 & Williams*, 29 Dec 1996 (UNSW), *De Nardi & Williams s.n.*, 30 Sep 1993 (UNSW 22141), *Griffith LSF3*, 15 Aug 1993 (NSW 283980); Starrs Creek catchment, south of Big Nellie, on main ridge below Tea Tree Trail, *Brown 97/59*, *Streiber & Crayn*, 13 Aug 1997 (NSW 411551, CANB, HO).

**Distribution:** this species is known only from the Lansdowne State Forest but may also occur in more northern areas of the Comboyne Plateau.

**Habitat:** on rock outcrops in sheltered stream gullies and damp roadsides, usually in slightly more open areas in the forest.

**Etymology:** from the Greek *macros* large and *anthos* flower; the specific epithet refers to the flower size.

**Notes:** a feature characteristic of this taxon is the basipetal maturation of the inflorescence. In no other Australian *Dracophyllum* do the flowers at the apex of the inflorescence mature first with sequential maturation down the inflorescence, nor does it appear to have been recorded in New Caledonian or New Zealand species. Other distinctive features are the dark pink corolla tube and white lobes (although *D. secundum* does exhibit a range of colour variations from off-white to bright pink) and the corolla tube, which is twice the length of any other Australian species of

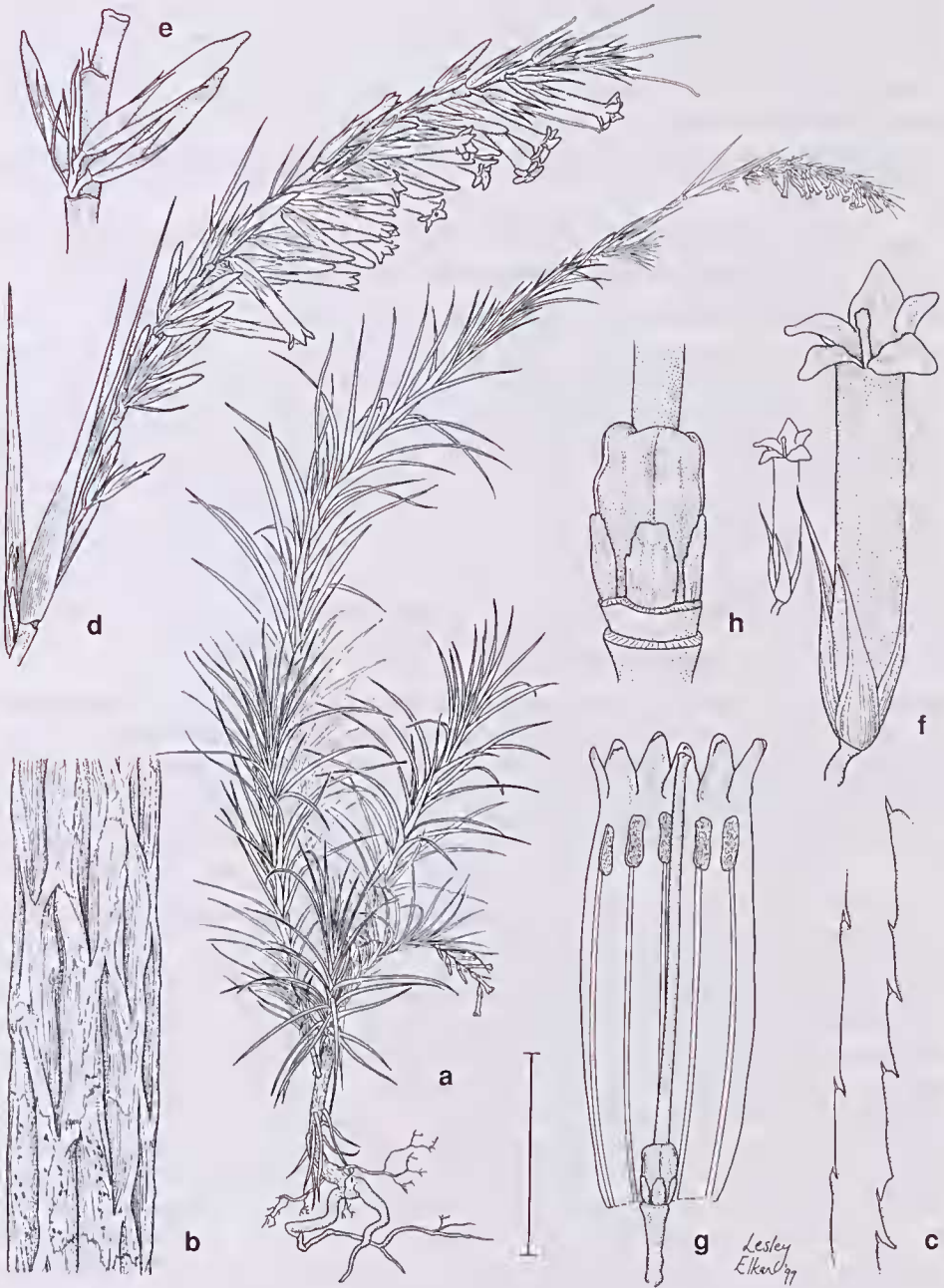


Fig. 1. *Dracophyllum macranthum* E.A.Br. & N.Streiber. a, Young plant with inflorescence; b, detail of bark on mature plant, showing deep regular fissures; c, detail of leaf margin, basal area to left, apical to right, showing well-developed teeth; d, detail of inflorescence, showing more mature flowers at apex, uppermost with corolla shed, buds and bracts present at base; e, basal node of inflorescence, showing flower buds and bracteoles; f, detail of flower (with life size sketch to left); g, open corolla, showing stamens and pistil; h, detail of ovary and nectary scales. (a, c–h Brown 97/50; b Brown 97/51). Scale bar: a = 160 mm; b & e = 20 mm; c & h = 2 mm; d = 40 mm; f & g = 10 mm.

*Dracophyllum*. In these respects, it is most similar to the New Caledonian taxon *D. alticola* Däniker, which has a rose-coloured to carmine corolla with a tube 10–17 mm long (but differs in a range of indumentum, nectary, inflorescence and leaf characters). The leaves and habit, other than the formation of a strong branch system, are most similar to those of *D. secuudum*, the closest populations of which occur in the Rylstone area 250 km to the south west (see Fig. 1 in Streiber et al. 1999).

Only old dehisced fruit were observed; fruit shape, size and seed characteristics could not be recorded.

**Conservation status:** unknown, occurring in localised populations and afforded some protection within the Lansdowne State Forest.

## 2. *Dracophyllum oceanicum* E.A.Br. & N.Streiber, sp. nov.

Frutex glaber, usque ad 2.5 m altus. Folia (90–)150–200(–230) mm longa, 10–15(–18) mm lata; margo laevis vel subserrulata. Inflorescentia ab imum usque ad apice maturescens, glabra; flores (10–)20–30(–35) per nodum basalem. Tuba corollae albida, 4–7 mm longa, calycem paulo superans; lobi corollae 1.5–2.5 mm longi, (1–)1.5–2 mm lati; stamina inclusa, filamentis 3.5–4.5 mm longis, fundo tubae insertis et ei nonnihil adhaerentibus. Squamae nectareae glabrae. Stylus crassus, tubum corollae aequans.

Holotype: New South Wales: South Coast: cliffs c. 300 m N of Point Perpendicular, Becroft Peninsula, Jervis Bay, 35°05'32"S, 150°48'28"E, 50 m alt., E.A. Brown 97/80, N. Streiber & C.C. Siuipson, 9 Sep 1997 (NSW 412483) Isotypes: BRI, CANB, CHR, NY.

[*Dracophyllum* sp. 'Jervis Bay' (Brown 97/80) in Streiber et al. (1999)]

Shrub 0.4–2(–2.5) m tall, glabrous, varying from low ± prostrate to robust and erect to spreading (in more sheltered positions), stem often branching extensively near base; bark somewhat fibrous, deeply and irregularly fissured, grey with reddish tinge towards base of fissures; branches distally reddish-brown, smooth between leaf scars. *Leaves* usually not persisting more than 40 cm below apex, erect to spreading and becoming recurved, sheathing at base; sheath greenish-brown to brown or pale buff, 12–17 mm long, 14–21 mm wide, usually gradually narrowed into lamina, occasionally ovate or with slight shoulder, margin membranous; lamina coriaceous, usually bronzed green, paler abaxially, linear-triangular, (90–)150–200(–230) mm long, (9–)10–15(–18) mm wide, flat to slightly concave; margin smooth or more commonly subserrulate, with 1 or 2(–4) teeth/cm; tip blunt and frequently broken off. *Inflorescence* (a variously modified superconflorescence, Streiber et al. 1999) terminal, flowers maturing acropetally, primary axis reddish brown; each node with a caducous leaf-like bract, with (10–)20–30(–35) flowers per basal node, reducing to 1 or occasionally 2 flowers per node distally (heavily shaded branches with as few as 4 flowers per basal node); flowers erect to spreading (rarely deflexed as a result of crowding). *Bracts* coriaceous, brown (sometimes whitish at the base, pink throughout or with a rose-coloured tip, becoming brown with age), triangular, c. 65 mm long and 15 mm wide at base of inflorescence to c. 10 mm long and 1.5 mm wide distally, sheath concave and well-developed, margin ciliate towards base or smooth, tip obtuse. *Bracteoles* scarious, golden brown, linear triangular, 6–8 mm long, 0.2–0.6 mm wide, margin ciliate distally, tip acute (flower often also subtended by a calyx-like bracteole immediately below calyx). *Pedice* pale to mid-brown, to 8 mm long. *Calyx* greenish white to white, often with apex tinged pink, frequently brown with paler more membranous margin in infructescence; lobes triangular, 5–7 mm long, 1.5–2 mm wide, 0.6–1 as long as corolla; margin with scattered minute teeth, ciliate distally, apex acute. *Corolla* off-white, lobes becoming brown with age; tube cylindrical-urceolate, 4–7 mm long, 2.5–3 mm diam.; lobes spreading to reflexed, ovate, 1.5–2.5 mm long, (1–)1.5–2 mm wide, base subcordate to truncate, apex obtuse,

papillate distally (outer surface less so) and densely rugose. *Stamens* with filaments inserted on the receptacle, 3.5–4.5 mm long, often adhering slightly to corolla tube but not fused to it; anthers attached at midpoint or slightly above, 0.5–2 mm long, included. *Pistil* ± as long as corolla tube; nectary scales separate, c. 1.5–2 mm long, often ± as long as ovary, upper margin ± rounded to rarely almost truncate, glabrous; ovary ± cylindrical to obovate, 1.5–3 mm long, 1–2 mm diam., smooth with slight indentation at locule septum; style cylindrical, stout, 2–3 mm long; stigma indistinctly 5-lobed. *Fruit* brown, shorter than calyx; style persistent; seeds not observed. (Fig. 2).

**Flowering:** August–December (April). **Fruiting:** ?January–February.

**Other specimens examined:** New South Wales: South Coast: Beecroft Peninsula, *Benson s.n. & Brown*, May 1985 (NSW 282397), *Brown 97/81, Streiber & Simpson*, Sep 1997 (MEL, NSW 412484, NY), 97/82 (AK, HO, NSW 412485), 97/83 (NSW 417002), 97/83 (CHR, NSW 412486), 97/84 (AK, CANB, NSW 412487, NY), *Constable s.n.*, 7 Oct 1960 (NSW 52725), *R. Cunningham s.n.*, 14 Mar 1979 (NSW 429949), *Crayn s.n. & Streiber*, Dec 1996 (UNSW 23312–23316, 23320/1–23322), *Lyne 374, McLeod & Makiuson*, 27 Aug 1991 (BISH, CBG 9105027, NSW, P), *Rodway 917*, 23 Oct 1932 (NSW 430747), *Vickery s.n.*, 17 Apr 1961 (NSW 429952), *Wiecek & Stricker s.n.*, Sep 1983 (UNSW 15616); Cape St George area, *Brown 97/87, Streiber & Simpson*, Sep 1997 (HO, NSW 412505), 97/90 (BRI, NSW 412512, NY), *Mills s.n.*, Mar 1988 (NSW 223690).

**Distribution:** probably restricted to the coastal cliffs and small bays of the north and south heads of Jervis Bay.

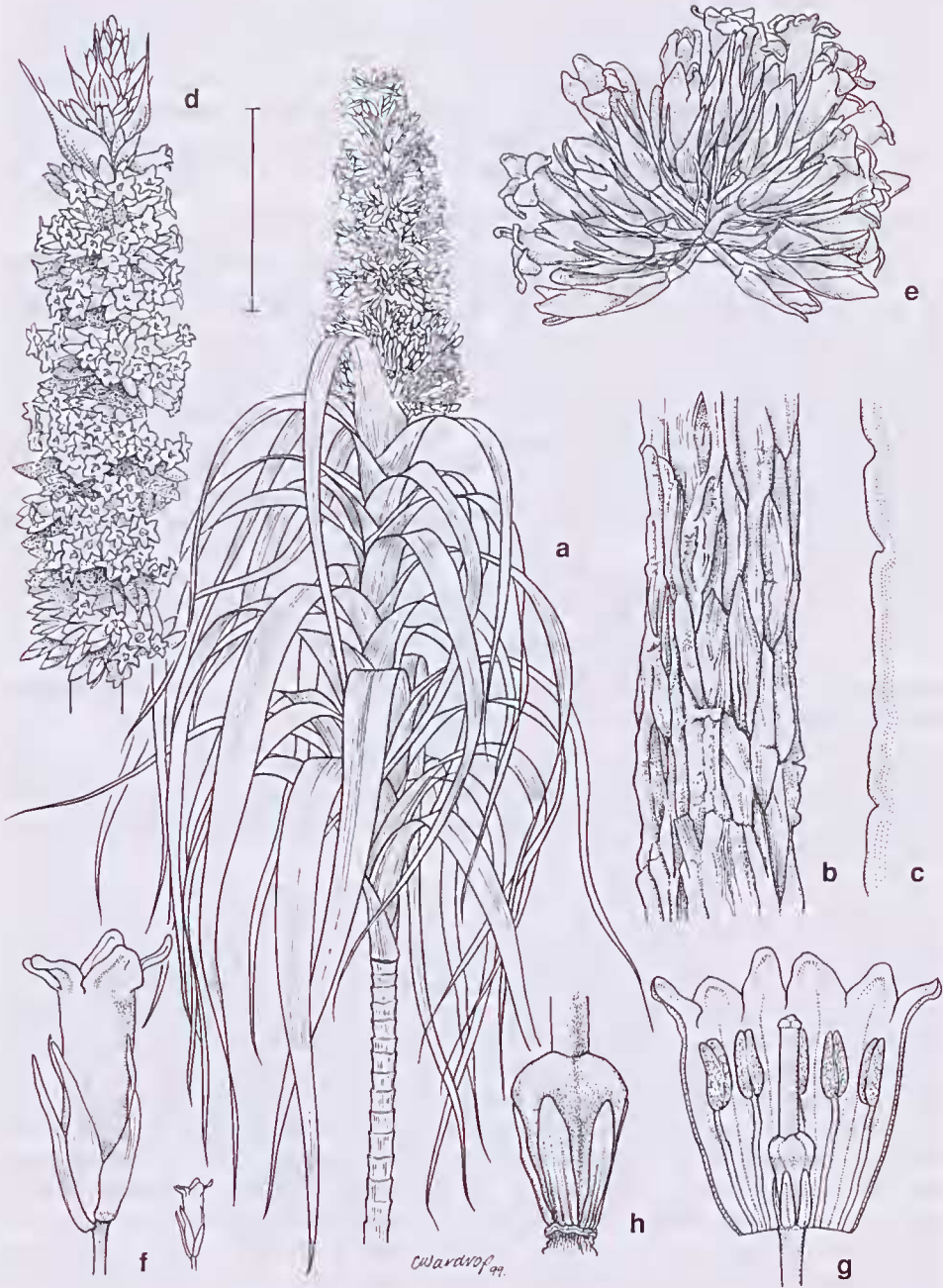
**Habitat:** on coastal cliffs overlooking ocean, or at the base of cliffs and on stream margins in sheltered bays, rarely more than 50 metres from the sea. The substrate is sandstone of the Conjola Formation, part of the Permian Shoalhaven group.

**Etymology:** from the Latin *oceanicus*, pertaining to the ocean or growing near the ocean, a reference to the habitat of this species.

**Notes:** the Shoalhaven group of sandstones, conglomerates and silty sandstones extends north and south of Jervis Bay (from Greenwell Point to near Point Upright). Cliff lines throughout the area need to be investigated to see if this species has a wider distribution than currently known.

*D. oceanicum* shows affinities with *D. fitzgeraldii* and *D. sayeri* (Streiber et al. 1999), all three having numerous flowers per node, an ability to form a large shrub/small tree, relatively wide coriaceous leaves and many floral measurements showing a degree of overlap. *D. fitzgeraldii* and *D. sayeri* typically have more development of the secondary axes in the inflorescence than *D. oceanicum*. The stamens in *D. oceanicum* are included in the corolla tube (compared with partially to fully exerted from corolla tube in the other two species) and staminal filaments are inserted on the receptacle and only slightly adhere to the corolla tube (as opposed to fused for most of their length in the other two taxa). *D. fitzgeraldii* and *D. oceanicum* have a capitate stigma (club-shaped in *D. sayeri*) and their corolla lobes are similar in shape (those of *D. sayeri* being longer and more triangular). *D. oceanicum* and *D. sayeri* have glabrous peduncles, pedicels and nectary upper margin whereas those of *D. fitzgeraldii* are ciliate/hairy. The relationship of these taxa to one another needs further work. Preliminary investigations of the *atpβ-rbcL* spacer were inconclusive (with c. six single base substitutions separating the taxa and much of that variation attributable to two different populations of *D. secundum*) and indicate that the taxa may have arisen relatively recently. Other techniques or different DNA regions would be required to resolve the relationships.

Only old dehiscent fruit were observed; fruit shape, size and seed characteristics could not be recorded.



**Fig. 2.** *Dracophyllum oceanicum* E.A.Br. & N.Streiber. a, Upper stem and inflorescence; b, detail of bark on mature plant, showing deep  $\pm$  regular fissures; c, detail of leaf margin, showing notches; d, detail of inflorescence, showing more mature flowers at base, some apical bracts present; e, basal node of inflorescence, showing branching, bracteoles and numerous flowers; f, detail of flower (with life size sketch to right); g, open corolla, showing stamens and pistil; h, detail of ovary and nectary scales. (a, c, e-g Brown 97/84; b Brown 97/81; d Brown 97/87; h Brown 97/90). Scale bar: a = 50 mm; b = 20 mm; c = 2 mm; d = 26 mm; e = 13 mm; f, g = 6 mm; h = 3 mm.

**Conservation status:** unknown. The taxon occurs in two protected areas, Booderee National Park to the south of Jarvis Bay and the Beecroft Peninsula Firing Range to the north, and appears to be relatively common along the coastal cliffs and inlets.

**3. *Dracophyllum secundum* R.Br., *Prodromus Florae Novae Hollandiae*: 556 (1810).**

**Type:** New South Wales: Parramatta, R. Brown s.n. [Bennett 2805], 18 June 1802 (BM-photo!, K-photo!)

*Epacris secunda* (R.Br.) Poiret in Lamarck, *Encyclopédie Méthodique, Botanique Suppl.* 2: 556 (1812).

*Prionotes secunda* (R.Br.) Sprengel, *Systema Vegetabilium* 1: 631 (1824).

*Dracophyllum secundum* f. *rubro-rosea* Domin, *Bibliotheca Botanica* 89: 501 (1928).

**Type:** New South Wales: Sandsteinfelsen der Blue Mts, *Domin IV*, 1910 (PR?, *n.v.*)

Shrub (0.1–)0.3–1(–2) m tall, glabrous; initially erect to spreading but branches frequently becoming pendent, occasionally prostrate; stem branching from near base, open and often sparsely branched or with branches in dense pseudo-whorls; bark sometimes present at base of branches, grey to brown, shallowly fissured; branches reddish brown, smooth between leaf scars. *Leaves* soon caducous, only persisting on distal 10 cm of branches (or up to distal 50 cm of young branches), occasionally with a glaucous bloom (more pronounced abaxially), erect to spreading, becoming recurved; basal sheath greenish brown to brown or pale buff, 9–17 mm long, 5–18 mm wide, usually gradually narrowing into lamina from c. ½ way up (sometimes from base), occasionally ovate or with slight shoulder, margin membranous; lamina coriaceous, usually mid- to dark green, paler abaxially, linear-triangular, (40–)50–160(–170) mm long, (3–)4–6(–18) mm wide, flat to slightly concave; margin serrulate, up to 7 teeth/cm basally, more numerous distally; teeth usually antrorse, but sometimes patent, often with a bulbous base (as in Fig. 1c), apex acute. *Inflorescence* (a variously modified superconflorescence, Streiber et al. 1999) terminal, flowers maturing acropetally; primary axis reddish brown; each node with a caducous leaf-like bract, (1–)3–5(–11) flowers per node basally and 1, or occasionally 2, flowers per node distally; flowers erect in bud, becoming deflexed to spreading, often secund. *Bracts* coriaceous, pale brown, often tinged green or pink apically or occasionally glaucous, typically ovate with acuminate tip (sheath forming ovate base and lamina reduced to a triangular appendage; sheath to appendage ratio varying with position in inflorescence); 25–80 mm long, 10–15 mm wide at base of inflorescence to 10–15 mm long, 5–10 mm wide distally, sheath ± concave and well-developed; margin and tip similar to those of lamina. *Bracteoles* scarious, golden brown, linear-triangular to narrowly ovate, 2.9–4.7 mm long, 0.4–1.1 mm wide; margin ciliate distally but occasionally smooth; apex acute. *Pedicel* white or greenish white to dark red, 0.5–2(–3.5) mm long (becoming longer in fruit). *Calyx* colour similar to corolla but often more intensely coloured basally or apically, brown in fruit; lobes triangular, (3–)4–6(–7) mm long, (0.9–)1.1–1.8(–2.2) mm wide, 0.5–0.7(–1) as long as corolla; lobes with margin ciliate distally; apex acute. *Corolla* off-white, occasionally pink splotched (especially lobe apices) or pale to mid-pink; tube cylindrical to very slightly urceolate, 4–8(–10) mm long, (1.5–)2–3(–3.5) mm diam; lobes initially erect, becoming reflexed, broadly ovate, 1–2(–3) mm long, 1–2(–3) mm wide, base subcordate to truncate, apex obtuse, inner surface papillate distally (outer surface often slightly papillate) and ± rugose. *Stamens* with filaments adnate to corolla tube, upper 1–2 mm free, rarely inserted on receptacle and c. 5 mm long; anthers attached at midpoint or slightly above, 0.5–2 mm long, included. *Pistil* ± as long as corolla tube; nectary scales separate, c. 0.5–0.7 as long as ovary, distally with margin truncate to rounded and often slightly toothed or uneven; ovary slightly obovate, 1.5–3 mm long, 1–2 mm

diam., smooth to 5-lobed; style stout, usually 3–4 mm long, minutely papillose throughout; stigma 5-lobed. Fruit brown, shorter than or equal to calyx,  $\pm$  globose, 3.5–5 mm diam., 5-lobed; style persistent; seeds pale brown, ovoid to slightly trigonous, c. 0.7 mm long, reticulate.

**Flowering:** July–December (but sporadic flowering occurs outside these months).

**Fruiting:** September–December (sporadic fruiting occurs March–August).

**Selected specimens (from 214 examined):** New South Wales: Central Coast: Bulli Tops, *Kennedy* 398, 18 Aug 1992 (NSW 259084); N of Minnamurra Falls, *Gilmour* 7505, 23 Oct 1993 (NSW 460603, CBG, MEL); 2.5 km E of Westcliff Colliery, *Keith* 208, 1 Feb 1986 (NSW 405009); Kellys Falls, *Brown* 97/21 et al., 31 July 1997 (NSW 411665, MEL, NY); Woy Woy Creek, *McBarron* 17515, 24 Aug 1969 (NSW 411238). South Coast: Wandean Road, *Brown* 97/97a & *Streiber*, 11 Sep 1997 (NSW 417007, AK); Wandandian Creek, *Robinson s.n.* & *Szigethy-Gynk*, 27 Mar 1998 (NSW 428648); Yerriryong, *Vost s.n.*, Aug 1930 (NSW 411508); Summit of Pigeon House, *Rodway s.n.*, Nov 1917 (NSW 411268); W of Little Forest, *Rodway s.n.*, 1 Aug 1937 (NSW 411521). Central Tablelands: Medlow Bath, *Coveny* 9448 & *Telford*, 18 May 1977 (NSW 411531, CBG, K, L); Track from Evans Lookout Road to Neates Glen, *Brown* 97/72, *Streiber* & *Taaffe*, 20 Aug 1997 (NSW 411650, CANB, MEL, NY); Kanimbula Valley, *Betteridge s.n.* (NSW 411237); Currant Mountain Gap, *Coveny* 6608 & *Hindl*, 10 Aug 1975 (NSW 411512, A, CANB, K, L, LE, RSA, UC, W); Colo Vale, *Cheel s.n.*, Aug 1908 (NSW 411507). Southern Tablelands: Mt Bulce, *Constable s.n.*, 28 Oct 1957 (NSW 45275); Mt Houghton, *Briggs* 4776, 1973 (NSW 411828); Corang Arch, *Craven* 8613 et al., 18 Oct 1990 (NSW 294983); Bulee Gap, *Wiecek* 489 & *Porter*, 23 Mar 1993 (NSW 268104, CBG).

**Distribution:** widespread and common in the Central and Southern Tablelands from the Rylstone area to the Nerriga area and the Central and South Coast from Woy Woy to Pigeon House Mountain.

**Habitat:** typically a plant of sheltered rock faces and ledges in gorges and valleys; grows on sandstone but also recorded from shale. Usually found in areas with high light intensities but capable of continued growth in shaded situations.

**Notes:** morphologically, this is an extremely variable species with a diverse range of habits. Plants normally have multiple branches from the base or from below ground. Subsequent branching is often in a pseudo-whorl. There are no records of plants forming a single unbranched stem of any significant length but the branching system ranges from sturdy and erect to lax and pendent.

Leaf size may vary considerably within populations and even within individual plants (from one branch system to another and sometimes from one part of a whorl to another).

Calyx and corolla colour is variable. Although the majority of populations have off-white calyces and corollas, a few have pale to mid pink perianths (e.g. *Brown* 97/97a, *Brown* 97/21). Some flowers also exhibit colour variation between and within the perianth whorls (e.g. *Brown* 97/72). The colour variation recorded is within a range that also occurs in a number of epacrid taxa such as *Woollisia pungens* (Cav.) F. Muell. and *Epacris impressa* Labill.

The type specimen of *D. secundum* f. *rubro-rosea* Domin has not been found and examined. Three Domin specimens have been located at PR, none of which match the protologue (one sterile specimen and two in fruit). The form is considered (from the description) to be part of the colour variation that is normal for *D. secundum*. With the exception of three of the four specimens of the Kellys Falls population (*Brown* 97/21), none of the colour variants in this taxon show any segregation in morphometric analyses (*Streiber* et al. 1999). *D. secundum* is widespread in the Blue Mountains, typically with white flowers but all other variations in flower colour do occur sporadically and it is the only taxon of *Dracophyllum* known from the area.



### Key to *Dracophyllum* species in New South Wales

- 1 Leaf margin smooth (or with little grooves or obscurely serrulate); mature leaves 15–40 cm long, 0.9–1.8 cm wide; inflorescence dense, with (10–)20–30(–60) flowers per basal node; corolla tube length  $\pm$  equal to sepal length.
- 2 Inflorescence with peduncles and pedicels glabrous; floral nectary glabrous on upper margin; occurring on the South Coast of New South Wales. .... *D. oceanicum*
- 2 Inflorescence with peduncles and pedicels bearing soft hairs c. 1 mm long; floral nectary ciliolate on upper margin; occurring on Lord Howe Island. .... *D. fitzgeraldii*
- 1 Leaf margin finely to distinctly serrulate; mature leaves 5–20 cm long, 0.3–1.0 cm wide; inflorescence open, less than 10 (or 11) flowers per basal node; corolla tube length usually exceeding sepal length.
- 3 Corolla tube 16–25 mm long; style more than 12 mm long; inflorescence maturing from apex to base, with 2 or 3 flowers per basal node. .... *D. macranthum*
- 3 Corolla tube 4–9 mm long; style 1–7 mm long; inflorescence maturing from base to apex, with (1–)3–5(–11) flowers per basal node. .... *D. secundum*

### Acknowledgments

We thank the following people and institutions for assistance: CANB, K and PR for access to their specimens and CHR for access to BM specimens on loan; field help and advice by staff of the Booderee National Park, Beecroft Peninsula Firing Range, New South Wales State Forests (Taree), D. Crayn, C. Simpson and G. Williams; botanical illustrations prepared by Lesley Elkan and Catherine Wardrop (both NSW), with some initial sketches by Nicola Oram (previously NSW); Barry Conn (NSW) and Chris Quinn (UNSW) for helpful comments and Peter Wilson (NSW) for the Latin descriptions.

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Manuscript received 1 September 1999

Manuscript accepted 28 October 1999